SML-100A

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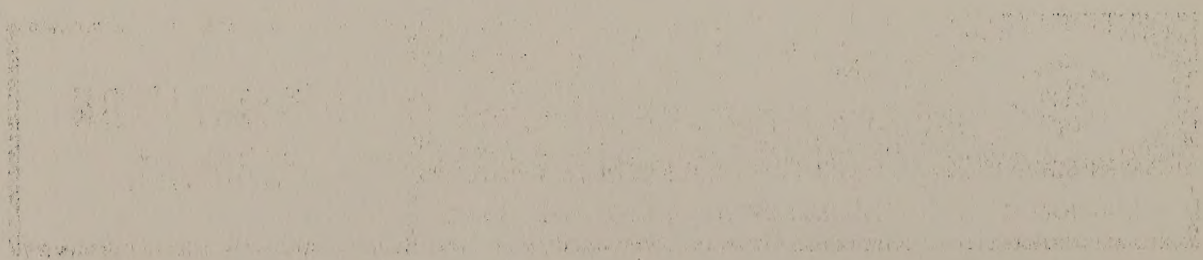
LING Electronics

A DIVISION OF LTV LING ALTEC, Inc.

INSTRUCTION MANUAL



MODEL

SML-100A

MULTI-LEVEL SELECTOR

IN ALL CORRESPONDENCE WITH THE FACTORY BE SURE TO INCLUDE THE FOLLOWING INFORMATION:

EQUIPMENT MODEL NUMBER

SERIAL NO. 104

LING NO. 42460

LING ELECTRONICS

A DIVISION OF LTV LING ALTEC, Inc.
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SECTION 1 - DESCRIPTION AND CHARACTERISTICS

1-1. GENERAL

a. The Ling Electronics Model SML-100A Multi-Level Selector is designed to select the largest of five attenuated accelerometer signals, normalize, amplify, and supply it as the control signal to a servo system. A separate attenuation level is supplied from front panel controls into each of the five accelerometer channels, and the signal having the greatest amplitude after attenuation is selected. The attenuation is adjusted to establish the desired maximum acceleration levels for various points within the system and specimen under test.

b. The Model SML-100A is designed to receive normalized 10 mv/g accelerometer signals ranging between 0.01 and 1.0 volt rms (1g to 100g). A precision calibrator, with a 10 mv rms/g rms accelerometer sensitivity reference, permits calibration of each channel to any selected value between 1g and 100g.

c. The Model SML-100A provides two outputs; one the selected signal amplified to a level sufficient for servo control, and the selected accelerometer signal at unity gain for metering and analysis.

1-2. PURPOSE

The purpose of the Model SML-100A is to select one input signal for use as the automatic gain control signal in a servo system.

1-3. SPECIFICATIONS

Frequency range	5 cps to 5,000 cps
Frequency response	±0.5 db, 10 to 5,000 cps ±1.5 db, 5 to 10 cps
Distortion	0.75% (servo channel)
Input impedance	50,000 ohms
Input level	0.01v rms to 1.0v rms
Output voltage	
a. Servo channel	0.7v rms, nominal
b. Accelerometer channel	Unity gain
Power requirements	117v, 60 cps
Inputs	5 signals
Calibrator accuracy	1%
Detector threshold accuracy	±0.5 db
Hum and noise	-35 db below 1v rms (servo channel)
Output indicator	5 indicator lamps to show which channel has been selected

TABLE 1-1 MODEL SML-100A TUBE COMPLEMENT

DESIGNATION	TYPE	FUNCTION
Differential Amp.		
1-V1	12AX7	Differential amplifier
1-V2	12AX7	Amplifier/cathode follower
Comparator		
V601-V901	6201	Relay amplifier
Chassis		
V1	12AT7	Calibration comparator
V2	6C4	Cathode follower
V3	OA2	Voltage regulator
V4	OA2	Voltage regulator

TABLE 1-2 MODEL SML-100A SEMICONDUCTOR COMPLEMENT

DESIGNATION	TYPE	FUNCTION
Comparator		
CR601-CR602	TI 56	Limiter
CR603-CR604	TI56	Comparator rectifier
CR701-CR702	TI56	Limiter
CR703-CR704	TI56	Comparator rectifier
CR801-CR802	TI56	Limiter
CR803-CR804	TI56	Comparator rectifier
CR901-CR902	TI56	Limiter
CR903-CR904	TI56	Comparator rectifier
Chassis		
CR1	1N2071	Meter rectifier
CR2-CR9	1N2071	Bridge rectifier

SECTION 2 - OPERATION

2-1. INSTALLATION

a. As soon as the unit is received, unpack and inspect it for shipping damage, loose knobs and components, or other defects.

b. All components of the Model SML-100A are contained in one rack mounting chassis. Proper connections for the unit are listed in table 2-1. Figure 2-1 is a dimensional drawing for use during installation.

c. Mount the unit in a 19-inch relay rack using standard hardware. Make the operational connections described in table 2-1. Provide adequate equipment ventilation.

d. If technical assistance is required, Ling field service personnel are available to assist in initial setup, checkout, and briefing instructions.

TABLE 2-1 MODEL SML-100A OPERATIONAL CONNECTIONS

CONNECTION		FUNCTION
ACC1 through ACC 5	-1	Signal ground
	-2	Accelerometer input
	-3	Chassis ground
SEL. ACC	-1	Signal ground
	-2	Selected accelerometer signal output (unmodified accelerometer signal).
	-3	Chassis ground
SERVO LEVEL	-1	Signal ground
	-2	Selected normalized signal output (amplified sufficient to drive servo).
	-3	Chassis ground
POWER		115 vac, 50/60 cps
B- (TB1-2 and 3)		Signal ground
GRD (TB1-1)		Chassis ground

2-2. PRE-OPERATION PROCEDURE

a. Perform this procedure only when the Model SML-100A is to be used in a new installation or with a different servo. To accomplish this procedure, the system and shaker must be operated at some low level of acceleration.

b. To make the pre-operation adjustments, proceed as follows:

(1). Determine whether the acceleration meter of the system servo indicates acceleration in peak or rms values. Select an additional acceleration meter which indicates the same values (peak or rms) as indicated by the system acceleration meter.

NOTE

The indications of the two meters are to be compared to adjust the output from the Model SML-100A so that the values indicated by the controls of the SML-100A are compatable with the system acceleration metering. In the event that the additional meter selected in step (1) does not provide the required value of indication, use the following formula to convert from rms to peak or from peak to rms indications:

1g rms = 1.4g peak
1g peak = 0.7g rms

(2). Make the following connections on the rear panel of the Model SML-100A:

(a). Connect the normalized SERVO LEVEL signal output to the compressor input of the system servo.

(b). Connect the selected acceleration signal (SEL. ACC.) output to the acceleration meter selected in step (1) above.

(c). Connect an acceleration signal with a sensitivity of 10 mv rms/g rms from an associated source follower or cathode follower to the ACC 1 connector.

(3). Select a low value of acceleration to be applied to the system shaker.

(4). Energize the Model SML-100A, and proceed as follows:

(a). Adjust the "G" LEVEL CAL. control to the value of the acceleration selected in step (3) above.

(b). Set the five "G" LEVEL controls fully clockwise.

(c). Set the FUNCTION SEL. switch to CAL.

(d). Press the channel 1 PUSH TO CALIBRATE switch and adjust the channel 1 "G" LEVEL control for a minimum indication (null) on the front panel meter.

(5). Energize the system and establish the level of acceleration on the shaker that was selected in step (3) above. Observe the acceleration meter connected to the SEL. ACC. output connector.

(6). Adjust the screwdriver potentiometer R25 on the front panel of the Model SML-100A until the acceleration level indicated by the meter at the SEL. ACC. output connector on the Model SML-100A is the same as the level set in step (3) above.

NOTE

Potentiometer R25 should need no further adjustment unless the Model SML-100A is transferred to another system. Values selected on the counter of the "G" LEVEL CAL. control will correspond to actual acceleration levels established for the system, as indicated on the meter associated with the system servo.

2-3. OPERATION

a. Make certain all the requirements of paragraphs 2-1 and 2-2 have been met. Refer to table 2-2 for a description of the functions of all operating controls and indicators. Locations of the operating controls and indicators are illustrated in figure 2-2.

b. To operate the Model SML-100A, proceed as follows:

(1). With power connected allow a five-minute warmup period.

(2). Set the five "G" LEVEL controls fully clockwise.

(3). Adjust the "G" LEVEL CAL. control until the internal counter indicates the maximum level (in g's) desired at channel 1.

(4). Set the FUNCTION SEL. switch to CAL.

(5). Press the channel 1 PUSH TO CALIBRATE switch and adjust the channel 1 "G" LEVEL control for a minimum indication (null) on the front panel meter.

(6). Repeat steps (3) through (5) for the remaining channels.

(7). The unit is calibrated and ready for automatic use at the programmed levels for each of the channels. The selected channel will be indicated by a corresponding front panel indicator.

TABLE 2-2 MODEL SML-100A CONTROLS AND INDICATORS

PANEL MARKING	REFERENCE DESIGNATION	DESCRIPTION AND FUNCTION
FUNCTION SEL.	S1	Rotary switch that selects the operation mode or single channel to supply the output signals.

TABLE 2-2 MODEL SML-100A CONTROLS AND INDICATORS (cont)

PANEL MARKING	REFERENCE DESIGNATION	DESCRIPTION AND FUNCTION
"G" LEVEL CAL.	R11	Ten turn potentiometer that supplies the reference level required to calibrate response of the five channels.
"G" LEVEL	R1, R3, R5, R7 and R9	Potentiometers that adjust the "g" level response of each channel.
PUSH TO CALIBRATE	S2 thru S6	Pushbutton switches that select a channel for "G" level calibration.
ACC 1 thru ACC 5	DS1 thru DS5	Indicator lamp that lights to show the channel selected.
No panel marking	M1	Meter used to indicate a null when a channel is calibrated.
No panel marking	DS6	Indicator lamp that lights when power is applied to the power supply circuit.
No panel marking	R25	Potentiometer that controls the level of the SERVO LEVEL output.

2-4. APPLICATIONS

a. Figure 2-3 illustrates selection from five acceleration signals for control signal (AGC) application to the Model S-10B.

b. Figure 2-4 illustrates selection from five acceleration signals for control signal application to the Model DA-10B Control Selector. The larger of the two signals, displacement from monitor and acceleration from the Model SML-100A, may be selected for control purposes by the Model DA-10B.

c. When the Model SML-100A is used in conjunction with the Model SCO-3 servo system, the SEL. ACC signal is monitored by the front panel meter on the SCO-3, and the SERVO LEVEL signal drives the compressor circuit. For connection to an SCO-3, the SERVO LEVEL signal is applied to pin 5 of the compressor receptacle. When connecting to an SCO-3-2, the SERVO LEVEL signal connects to pin 3 of compressor receptacle.

d. A VTVM connected to the SEL. ACC connector on the SML-100A will indicate the actual signal level of the selected accelerometer signal.

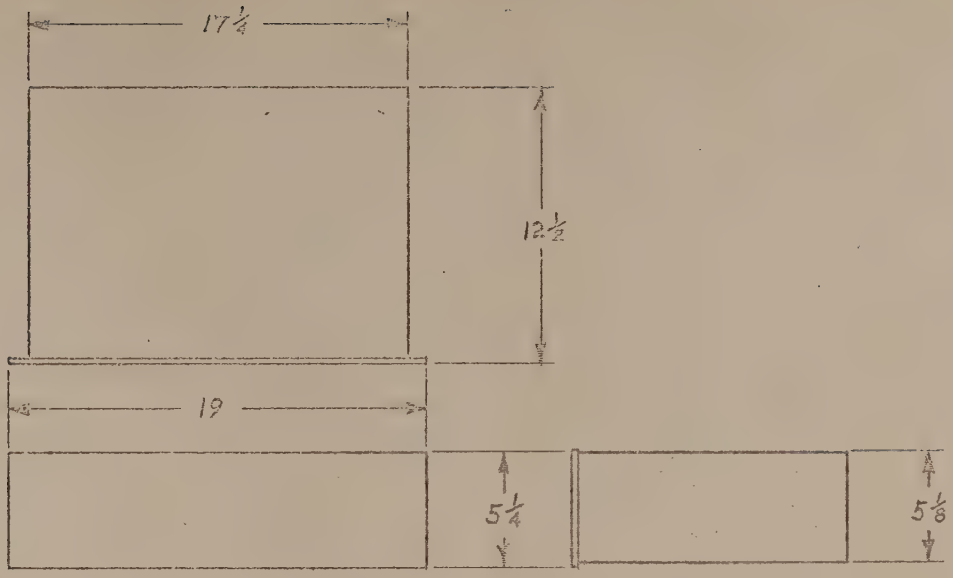

Fig. 2-1 Model SML-100A Dimensional Drawing

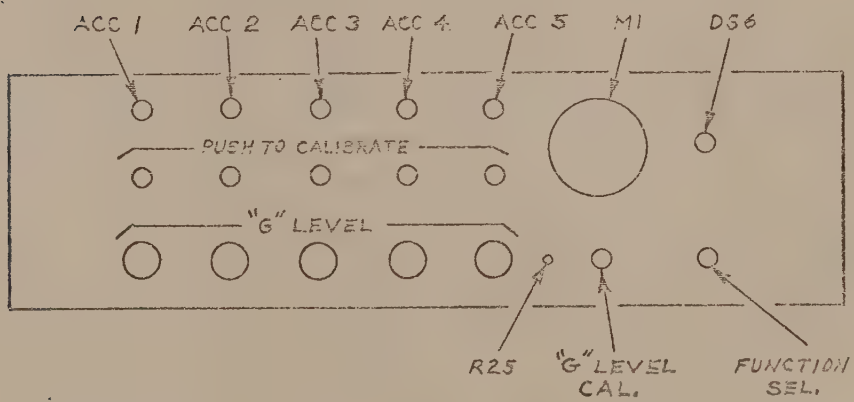

Fig. 2-2 Model SML-100A Controls and Indicators

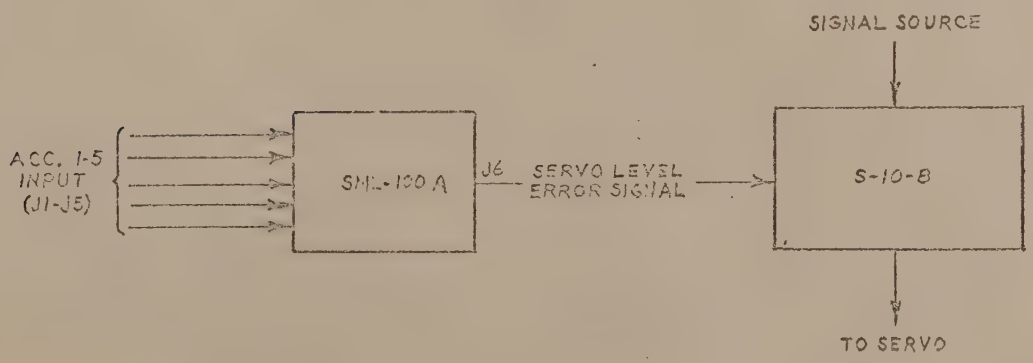

Fig. 2-3 Model SML-100A Used With Model S-10-B Servo

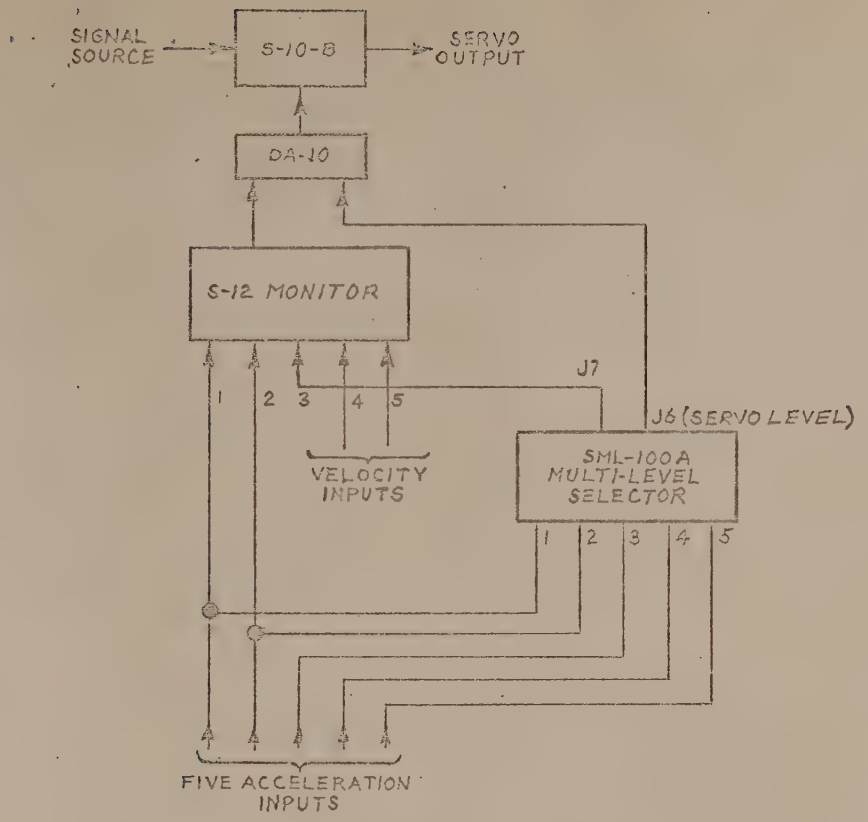

Fig. 2-4 Model SML-100A Used With the S-11 Servo System

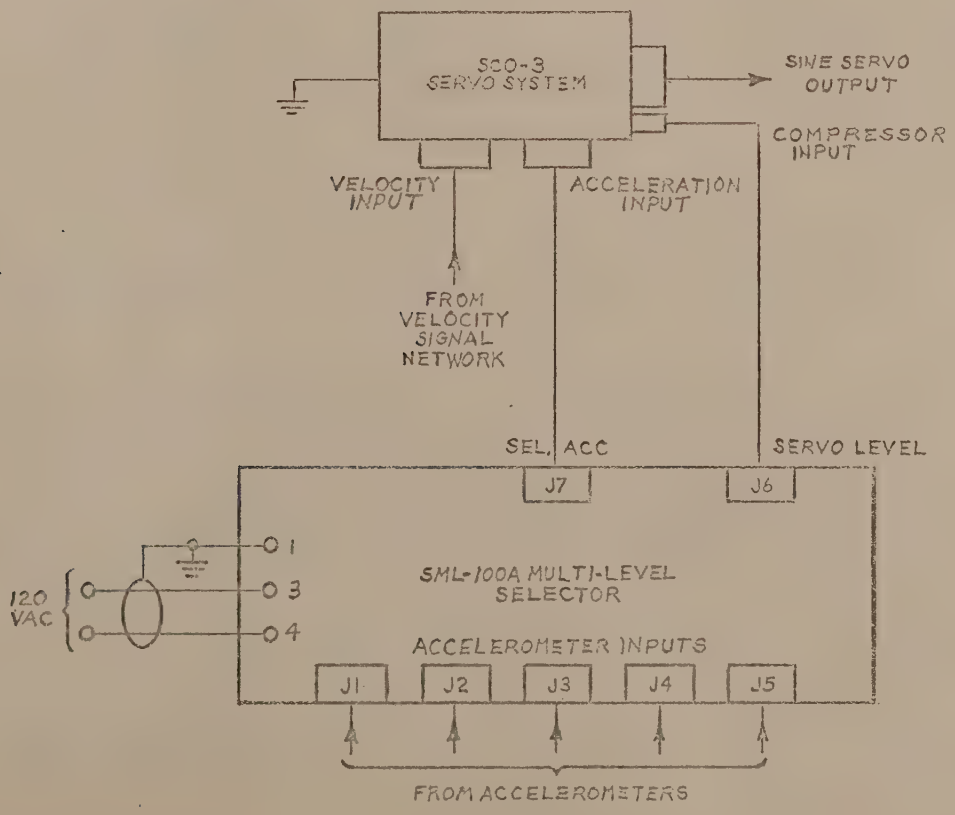

Fig. 2-5 Model SML-100 Interconnected to Model SCO-3 Servo System

SECTION 3 - PRINCIPLES OF OPERATION

3-1. INTRODUCTION (refer to figure 3-1)

a. The Model SML-100A is a five-channel unit designed to select one of its acceleration signal inputs for use as a servo control voltage. The unit consists of five differential amplifiers, a four-stage comparator, and a power supply. The Model SML-100A also includes an internal calibration circuit to adjust each channel for control of some maximum acceleration level.

b. An accelerometer signal is connected to each channel, attenuated by a precalibrated factor with a channel input potentiometer, and applied as one input to the channel differential amplifier (an operational amplifier with differential inputs). A reference voltage is used for the second differential amplifier input. Adjustment of the input potentiometer determines the gain of the operational amplifier, thereby determining the amplitude of the control signal output.

c. The output signals are applied to the comparator circuits where the largest signal is determined by serial comparison and selected as the controlling signal output. Signal selections are made through relays associated with each comparator circuit. The relays simultaneously apply the unmodified accelerometer signal for the selected channel to a separate output connector.

d. From the comparator network, the signal is connected through a cathode follower to provide impedance matching and a final gain normalization.

e. As system test frequencies are changed, test specimens may go through several resonances. When accelerometers are mounted on resonance points, the system servo will limit the vibration level at these resonance points to the preset levels.

3-2. CALIBRATION CIRCUIT (refer to figure 3-2)

a. The calibration circuit provides a means of presetting each channel to control a maximum acceleration level. The calibrating voltage is derived from the 6.3 vac, 60 cps filament supply. All channels are individually calibrated in the following manner.

b. Front panel "G" LEVEL CAL. control R11 is to be set for some acceleration level indication on its associated counter. This setting determines the value of calibration voltage applied to the channel when the associated channel switch (S2) is pressed. The associated front panel "G" LEVEL potentiometer (R1, R3, R5, R7 and R9) adjusts the signal gain for comparison with the calibrating signal. The differential signal is amplified, rectified, and applied to the meter. The channel is adjusted properly when the meter provides a minimum indication.

3-3. DIFFERENTIAL AMPLIFIER CIRCUIT DESCRIPTION (refer to Ling Drawing 50004)

a. The accelerometer signal is applied to the grid of tube V1A. A constant +1.3 vdc reference voltage is applied to the grid of tube V1B. The cathodes

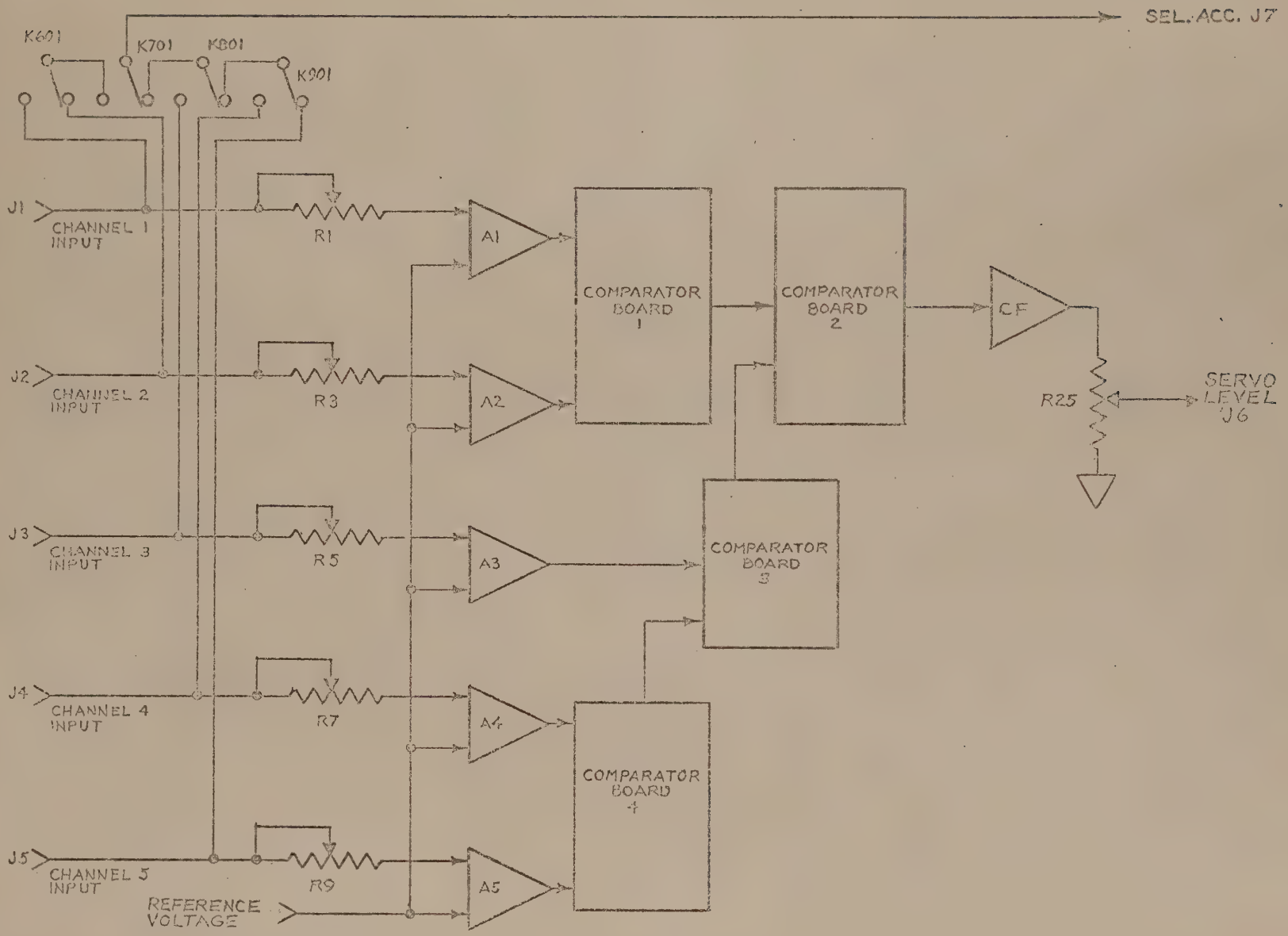

Fig. 3-1 Model SML-100 Functional Block Diagram

of tube V1 are tied together to form a differential amplifier. The signal output from tube V1 appears at the plate of V1B and is in phase with the accelcrometer signal input. The signal is dc coupled through resistor R1 and applied to the grid of amplifier tube V2A. The signal from V2A is dc coupled through resistor R15, and neon lamps D1 and D2 to the grid of cathode follower V2B. Tube section V2B provides the proper impedance matching for the amplifier output circuit.

b. The feedback circuit through resistor R5 establishes the overall gain of the amplifier.

3-4. COMPARATOR CIRCUIT DESCRIPTION (refer to Ling Drawing 50004)

a. Each comparator circuit accepts two signals and selects the larger signal as the output. The signals are rectified to opposing polarities through the rectifier/regulator network and summed on the grid of section A of the relay amplifier tube. The amplified signal is dc coupled to the grid of section B where the signal selector relay is controlled.

b. The relay amplifier has a positive feedback loop, increasing the amplifier gain to make the selection more positive. Selection threshold is determined by the setting of the potentiometer in the cathode circuit of the relay amplifier.

3-5. POWER SUPPLY CIRCUIT DESCRIPTION (refer to Ling Drawing 50004)

a. Operating power is connected to connector J8 and applied to the power transformer T1. Diodes CR2 through CR9 form a full wave center tapped rectifier in the high voltage secondary winding of transformer T1. Two diodes are required in each rectifier leg to achieve sufficient reverse current resistance.

b. The positive and negative rectified voltages are applied to similar regulator circuits where unregulated +300 vdc and regulated +150 vdc operating voltages are derived. The ±1.3 vdc reference voltage required by the differential amplifiers is regulated by tube V3 and taken at the junction of capacitor C10 and resistor R19.

c. The filament power is taken at the 6.3 vac transformer winding. The 5 volt transformer winding is not used.

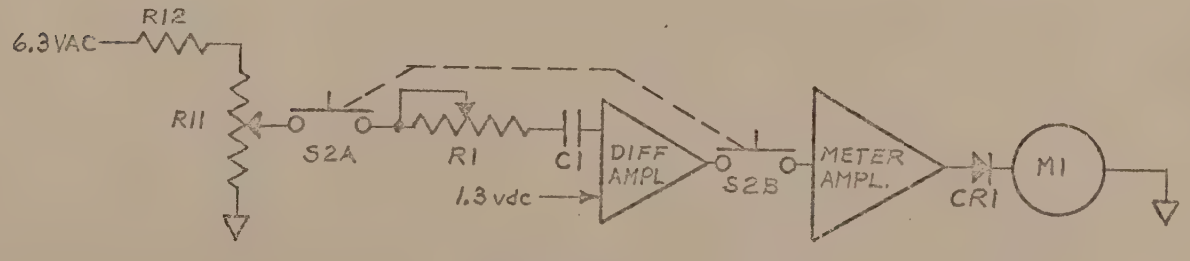

Fig. 3-2 Calibration Circuit Block Diagram

SECTION 4 - MAINTENANCE

4-1. ANALYSIS

a. The first step in servicing a defective Model SML-100A is to localize the fault. Some faults can be located by sight, smell, or hearing. Before performing any tests listed, make a complete visual inspection for evidence of overheating, cracked insulation, defective solder connections, etc.

b. The following is a list of checkout information provided in this section to simplify and shorten work required during equipment maintenance.

(1). Trouble shooting indications are provided to localize a defective part.

(2). Calibration procedures are provided to align internal operating circuitry for optimum performance.

(3). Cleaning instructions are provided. Dust and corrosion are often responsible for equipment failures.

CAUTION

Before removing the Model SML-100A for maintenance, make certain it is actually at fault. This unit is one component in an integrated system. Malfunctions in associated components may appear in the Model SML-100A. Haphazard adjustments to correct malfunctions may necessitate entire circuit realignments.

4-2. TROUBLE SHOOTING

Table 4-1 provides a list of troubles and their probable causes or remedies. Figures 4-1 and 4-2 illustrate the locations of parts within the Model SML-100A.

TABLE 4-1 MODEL SML-100A TROUBLE SHOOTING

TROUBLE	CAUSE AND/OR REMEDY
Power supply will not regulate.	Check power supply reference tubes, V3 and V4 and RC filter networks.
No output from one channel	Check affected channel differential amplifier. Check associated comparator circuit. (1). Channels 1 and 2 - 1 and K601 (2). Channels 3, 4 and 5 - 3 and K801 (3). Channels 4 and 5 - 4 and K901 (4). All channels - 2 and K701

TABLE 4-1 MODEL SML-100A TROUBLE SHOOTING (cont)

TROUBLE	CAUSE AND/OR REMEDY
No channel will calibrate.	Check tubes V1 and diode CR1
	Check "G" LEVEL CAL. potentiometer R11.
	Check calibration meter.
One channel will not calibrate.	Check channel circuit for defective vacuum tubes, short, or open circuit.
	Check associated deck of switch S1.
Non-linear frequency response in any channel.	Check the RC network between tubes in the differential amplifier.
	Check the amplifier feedback circuits.
	Check D1 and D2.
Unstable differential amplifier output.	Check associated feedback circuits.
	Check the 1.3 vdc reference voltage on terminal D.

4-3. TEST EQUIPMENT

a. Audio Oscillator, Hewlett-Packard Model 202C or equivalent.

b. Distortion Analyzer, Hewlett-Packard Model HOI 330B or equivalent.

c. Multimeter, Simpson Model 270 or equivalent.

d. Input connectors to provide simultaneous input to two Cannon XLR-3-14 receptacles.

e. Output connector to mate with one Cannon XLR-3-13 receptacle.

4-4. TESTING AND CALIBRATION

a. Continuity Checks:

(1). Measure resistance between the GRD terminal and pin 3 of rear panel connectors J1 through J8. Resistance should be less than 1/4 ohm.

(2). Measure resistance between the B- terminal and pin 1 of rear panel connectors J1 through J8. Resistance should be less than 1/4 ohm.

b. Preliminary Connections:

e. Channel Selection

(1). Set all "G" LEVEL controls to 100.

(2). Set the "G" LEVEL CAL. control to 10.0.

(3). Apply 0.10 volt rms at 500 cps to ACC 1 through ACC 5 simultaneously. 2, 3, 4,

(4). Set the FUNCTION SEL. switch to CAL.

(5). Press and hold the PUSH TO CALIBRATE pushbutton for channel 1 and adjust the associated "G" LEVEL control for a null on the front panel meter.

(6). Release the pushbutton.

(7). Set the FUNCTION SEL. switch to AUTO.

(8). Connect the distortion analyzer to the SERVO LEVEL connector. Set the analyzer for 0 db.

(9). Slowly adjust the "G" LEVEL control for channel 2 counterclockwise until the unit selects channel 2.

(10). In db, record the difference in outputs between channel 1 and channel 2 at the point where channel 2 is selected.

(11). Slowly rotate the "G" LEVEL control for channel 2 clockwise until channel 1 is again selected.

(12). In db, record the difference in outputs between channel 1 and channel 2 at the point just before channel 1 is selected.

NOTE

The test channel should select when the output voltage is within plus or minus 0.5 db of the reference channel. If necessary, adjust potentiometer R615.

(13). Reset all "G" LEVEL controls to 100.

(14). Set the FUNCTION SEL. switch to CAL.

(15). Calibrate channels 4 and 5 for 10.0g.

(16). Set the FUNCTION SEL. switch to AUTO.

(17). Adjust the analyzer for zero db reference.

(18). Repeat steps (9) through (12) for channels 4 and 5. The potentiometer to adjust is R915.

(19). Set the "G" LEVEL control for channel 4 to 100.

(1). Connect a jumper between the GRD and B- terminals.

(2). Connect earth ground to the GRD terminal.

(3). Connect the audio oscillator output to the ACC 1 through ACC 5 connectors. (refer to table 2-1).

(4). Connect the multimeter to monitor the signal at the SERVO LEVEL connector.

c. Calibrated Gain:

(1). Apply power and allow a 5-minute warmup period.

(2). Set all "G" LEVEL controls to 100.

(3). Set the FUNCTION SEL. switch to CAL.

(4). Set the "G" LEVEL CAL. control to 10.0.

(5). Press and hold the PUSH TO CALIBRATE pushbutton for channel 1, and adjust the associated "G" LEVEL control for a null on the front panel meter. This calibrates channel 1 for a 10g operating level.

(6). Apply 0.10 volt rms, 500 cps to the ACC 1 input connector.

(7). Set the FUNCTION SEL. switch to AUTO. The unit should select channel 1 and the multimeter should indicate a signal of from 0.66 volt to 0.74 volt rms at the SERVO LEVEL connector.

d. Channel Calibration Extremes:

(1). Set all "G" LEVEL controls to 1.

(2). Set the "G" LEVEL CAL. control to 1.0.

(3). Set the FUNCTION SEL. switch to CAL.

(4). On each channel, press and hold the PUSH TO CALIBRATE push-button and adjust the associated "G" LEVEL control for a null on the meter. The channels will be calibrated for between 0.9g and 1.2g.

(5). Set all "G" LEVEL controls to 100.

(6). Set the "G" LEVEL CAL. control to 100.

(7). Calibrate each channel by pressing the PUSH TO CALIBRATE push-button and adjusting the associated "G" LEVEL control for a null on the front panel meter. The maximum setting of each "G" LEVEL control should permit a calibration in excess of 98g for each channel.

(20). Calibrate channel 3 for 10.0g.

(21). Repeat steps (9) through (12) for channels 3 and 5. The potentiometer to adjust is R815.

(22). Set the "G" LEVEL control for channel 3 to 100.

(23). Calibrate channel 1 for 10.0g.

(24). Repeat steps (9) through (12) for channels 1 and 5. The potentiometer to adjust is R715.

f. Noise Measurements:

(1). Disconnect the signal generator from connectors ACC1 through ACC 5.

(2). Set all "G" LEVEL controls to 1.

(3). Set the FUNCTION SEL. switch to ACC 1 through ACC 5 successively.

(4). Measure the noise voltage at the SERVO LEVEL connector for each switch position. The noise voltage should be less than 0.01 volt rms for each channel.

g. Frequency Response:

(1). Set all "G" LEVEL controls to 100.

(2). Adjust the analyzer for 0 db reference with a 0.7 volt audio frequency input.

(3). Apply 0.01 volt rms 500 cps input to the ACC 1 through ACC 5 connectors.

(4). Individually set each "G" LEVEL control to 1, and measure the frequency response at 5 cps, 10 cps, 500 cps and 5,000 cps. Return each "G" LEVEL control to 100 before measuring another channel.

(5). Individually set each "G" LEVEL control to 1, and record the output voltage difference in db between indications obtained and 0.7 volt at the SERVO LEVEL connector. The frequency response should be within plus or minus 0.5 db from 10 cps to 5,000 cps.

h. Distortion

(1). Calibrate all channels for 10.0g (refer to paragraph c).

(2). Apply 0.1 volt rms at 500 cps to the ACC 1 through ACC 5 connectors.

(3). Set the FUNCTION SEL. switch to positions ACC 1 through ACC 5 and measure the distortion at the SERVO LEVEL connector for each switch setting. The distortion should be less than 0.75 percent.

4-5. CLEANING

The only cleaning necessary for the Model SML-100A is to keep the chassis free from dust. To clean the chassis, use low pressure air, a vacuum cleaner, or a soft bristled brush. Use particular care when cleaning printed circuit boards as they are easily damaged.

4-6. OTHER DIFFICULTY

In the event of troubles not covered in this manual, contact the factory giving serial number, Ling number, conditions of use, and a full description of the problem. Ling field service personnel are constantly available for consultation on special problems concerning utilization or application of Ling equipment.

CODE TO MANUFACTURERS

A	ALTEC
AA	AIR ASSOCIATES
AB	ALLEN BRADLEY
AC	ASTRON CORPORATION
ACDC	ACDC ELECTRONICS
AD	ADVANCE RELAY
AD-YU	AD-YU LABS
ADEL	ADEL
ADL	ADLAKE
ADMS	ADAMS & WESTLAKE
AH & H	ARROW-HART & HEGEMAN
AI	AIRCRAFT
AIRM	AIR MARINE PRODUCTS
AJAX	AJAX CONDENSER
AL	ALLEN MFG.
ALB	ALBION
ALCO	W. D. ALLEN (ALLENCO)
ALL	ALLIS CHAMBERS
AM	AMATOM
AMC	AMSCO
AME	AMPERITE CO.
AMM	AMMON INSTRUMENTS INC.
AMP	AMPHENOL
AMPX	AMPEX
ANA	ANALOGUE CONTROLS
AP	AIRPAX ELECTRONICS
APH	ALPHA
API	AMERICANPAMCOR
APREX	AMPEREX
AQ	AEROQUIP
AR	AEROVOX
ARCO	ARCO ELECTRONICS
ARM	ARMSTRONG CORK CO.
AS	ASSOCIATED SPRING
ASP	ASSEMBLY PRODUCTS
ATLE	ATLEE
AU	AUGAT
AUTO	AUTOMATIC ELECTRIC
BAS	BASSICK
BC	BARBAR COLMAN
BECK	BECKMAN INSTRUMENTS
BEL	BELDEN
BEN	BENDIX
BG	BOSTON GEAR
BI	BIRNBACH
BIRT	BIRTCHER
BLY	BLILEY
BO	BODINE
BOU	BOURNS "TRIMPOT"
BOW	BOWERS
BP	BOGEN-PRESTO
BRE	BREEZE "AERO SEAL"
BRY	BRAYANT
BUD	BUD RADIO
BUCH	BUCHANAN
BUG	BUGGIE
BUR	BURROUGHS
BUSS	BUSSMAN MFG.
B & K	BRUEL & KJAER
C	CHATHAM
CA	CARLING ELECTRIC
CAL	CALIDYNE
CALC	CALIFORNIA CHASSIS
CALR	CALIF. RESISTOR CORP.
CAN	CANNON
CCI	CONTINENTAL CARBON, INC.
CD	CORNELL DUBILIER
CDM	CURTIS INDUSTRIES
CH	CHICAGO STANDARD TRANS.
CHA	CHATHAM ELECTRONICS
CHD	CROUSE HINDS
CHSH	CHASE-SHAWMUT
CI	CINEMA
CJ	CINCH-JONES
CK	CONROY & KNOWLTON
CL	CLARK CONTROLER CO.
CLAR	CLAROSTAT
CM	CMPUTER MEASUREMENTS
CMQP	CHEMQUIP
COR	CORNISH
CP	COMMUNICATION PROD.
CRA	CRAMER CONTROL
CRAF	CRAFTSMAN
CRIT	CRITTENDEN
CRL	CENTRALAB
CRN	CRANE
CT	CHASSIS TRAK
CTS	CH. TELE SUPPLY
CU	CURTIS
CUT	CUTLER HAMMER
D & H	D & H AWNING
DA	DAYTON
DALE	DALE
DECO	DEECO
DEFT	DEECO FELT
DELR	DELRY
DI	DIALITE CORP. (DIALCO)
DIC	DICKSON ELECTRONICS
DICO	DIAMOND MFG. (DICO)
DM	DIAMOND METAL
DOS	DOSSERT
DR	DELCO RADIO
DRAK	DURKEE-ATWOOD
DUC	DUCOMMON
DUM	DUMOND
DY	DYMEC
EC	ELECTRO CUBE
ECK	ECKTRONICS
ED	EDCLIFF INST.
EDEC	ELECTRO DEVELOPMENT CO.
EE	ELECTRONICS ENCLOSURES
EEW	ELECTRO ENG. WORKS
EF	ELECTRO FAB.
EI	EIMAC
EM	ELECTRO-MEASUREMENTS
ELCO	ELCO
ELDM	ELDEMA
ELME	ELMENCO
ELTC	ELECTRAC
EMC	EMCOR
EMEC	EMEC
EMP	EMPCO
ENDV	ENDEVCO
EP	ENGINEERING PROD.
ER	ERIE
ERA	ELEC. RESEARCH ASSOC.
ERC	ELECTRA RESISTOR CORP.
ES	EAGLE SIGNAL
ESCO	ELECTRO-SWITCH CORP.
ESNA	ELASTIC STOP NUT
ESX	ESSEX
EVER	EVEREST
F	FENWAL
FAN	FANSTEEL
FCHD	FAIRCHILD
FED	FEDERATED SEMICOND
FED-S	FEDERAL SCREW
FEI	FEDERAL ENTERPRISE, INC.
FF	FEDERAL FASTENING
FL	FLUKE, JOHN MFG.
FP	FISHER-PORTER
FR	FRANZ
FU	FULLER
GA	GATES
GAXY	GALAXY
GC	CENERAL CEMENT
GCON	GENERAL CONTROL
GDL	GOOD-ALL ELECTRIC
GE	GENERAL ELECTRIC
GEN	GENTRONICS
GLA	GEELAR
GL	GLOBAR
GNI	GENERAL INSTRUMENTS
GR	GENERAL RADIO
GRAY	GRAYBAR
GRHL	GRAYHILL
GRIS	GRIGSBY CO.
GS	GLASTIC
GU	GUDEMAN
GV	G. V. CONTROL
HAM	HAMMERLUND MFG.
HAW	HARTWELL
HAYS	HAYS MFG.
HE	HEINEMANN
HEY	HEYCO
HEYM	HEYMAN MFG.
HP	HEWLETT-PACKARD
HL	HELIPOT
HOF	HOFFMAN
HOP	HOPKINS
HS	HARDWARE SPEC.
HTD	HUDSON TOOL & DIE
HU	HUBBEL
HY	HYCOR
HYD	HAYDON
HZE	HEINZE
IEI	INT. ELEC. IND.
IERC	INT. ELEC. RESEARCH CORP.
IGNS	INGERSOL RAND
III	INT. INSTRU. INC.
IL	ILSCO
ILG	ILG
IMP	IMPERIAL
IND	INDIANA GENERAL
INSU	INSULINE
IRC	INT. RESISTOR CORP.
IREC	INT. RECTIFIER CORP.
IS	INSULATION SUPPLY
ITE	ITE CIRCUIT BREAKER
ITT	ITT (FEDERAL)
J	JOHNSON
JAN	JAN HARDWARD MFG.
JE	JEFFERSON
JEN	JENSEN
JNC	JANCO
JNG	JENNINGS
JON	JONATHAN MFG.
K	KEMET
KENR	KEINER
KH	KRON-HITE
KING	KING
KT	KOOLTRONIC
KU	KULKA
KZ	KURZ-KASCH
LA	LYNCH ASBESTOS
LAMB	LAMBDA
LAR	L. A. RESISTOR
LE	LEACH
LER	LERCO
LI	LITTLE FUSE
LING	LING ELECTRONICS DIV.
LMB	LMB
LP	LAPP
LPD	LA-DEAU PROD.
LUNK	LUNKENHEIMER
M	MILLEN
MA	MALLORY
MD	MICRODOT
ME	METTSCRAFT
MEC	MEC
MH	MINNEAPOLIS HONEYWELL
MICA	MICAMOLD
MIN	MINARIK
ML	MACHLETT
MLR	MILLER CO.
MMN	MARMON
MN	MARION
MOD	MODULONICS
MON	MONITOR
MOR	MORENO
MOSE	MOSELEY
MOSS	MOSSMAN
MRC	MARCO
MRY	MURRAY
MS	MICROSWITCH
MTRO	MOTOROLA
N	NATIONAL CO.
NC	NATIONAL WIRE & CABLE
NE	NETWORK MFG.
NEI	NATIONAL ELEC. INC.
NEP	NATIONAL ELEC. PROD.
NEX	NEXAS RESEARCH LABORATORY
NHBB	NEW HAMP. BALL BEARING
NIBCO	NORTHERN INDIANA BRASS
NL	NATIONAL LOCK
O	OHMITE
OZ	O. Z. ELECTRICAL MFG. CO.
PACR	PACIFIC RESISTOR
PAN	PANDUIT
PANX	PANDUX
PC	POWER COMPONENTS
PCA	PCA
PE	PEERLESS
PENN	PENN CONTROL
PER	PERMOID
PERM	PERMALI
PH	PHILLIPS CON. (PHILTROL)
PHIL	PHILBRICK RESEARCH
PIC	PIC DESIGN
PREM.	PREMIER METAL PROD.
PRKR	PARKER ELECTRICAL INST.
PRYN	PRYNE
PTB	POTTER-BRUMFIELD
PULS	PULS ENGINEERING
PY	PYRAMID
QE	QUALITY ELECTRIC
R	ROTRON
RAY	RAYTHEON
RBC	RUBBERCRAFT
RCA	RADIO CORP. OF AMER.
RCC	RADIO CONDENSER CO.
RDL	RADIO DEVELOPMENT LAB
RE	REPUBLIC GLASS
REN	RENBRANDT
ROB	ROBERTSHAW-FULTON CON.
ROME	ROME
RT	RATIGAN
RY	RYTRON
S	SIMPSON
SA	SANGAMO
SAR	SARAN
SCN	SCANBE MFG. CORP.
SD	STRUTHERS-DUNN (DUNCO)
SE	SERVICE
SEA	SEASTROM
SEL	SELCO
SEM	SEMTECH CORP.
SEP	STANDARD ELECT. PROD.
SFTM	SAFE-T-MIKE
SH	SHALL CROSS
SI	SIGMA
SIE	SOUTHWESTERN IND. ENG.
SIG	SIGNAL
SKI	SARKES TARZIAN
SK	SPENCER-KENNEDY-LABS.
SM	STANLEY MORRIS
SMC	SPECIALTIES MFG.
SMI	H. H. SMITH
SN	SNAP-TITE
SOLA	SOLA ELECTRIC
SOR	SORENSON
SP	SPRAGUE
SPC	SPECTROL
SPR	SUPREME
SQ	SQUARE D
SR	SIERRA ELECT. CORP.
SREC	STANDARD RECTIFIER
SS	SPECTRA-STRIP
STAH	STAHLIN BROS.
STAN	STANTRON
STHC	SOUTH CO
STIM	STIMSON, E. B.
STW	STANDARD WIRE & CABLE
SU	SUPERIOR ELECTRIC
SUPT	SUPRENANT
SW	SWITCHCRAFT
SW-CT	SWITCHING CONTROL
SWGL	SWAGELOCK
SY	SYLVANIA
T	TRIAD
T & B	T & B (CONNECTORS)
TCC	TECHNO-COMPONENTS CORP
TEM	TEMPLE
TH	THERMADOR
THR	THERMALOY CO.
TI	TEXAS INSTRUMENT
TIC	TECHNOLOGY INST. CORP.
TIM	TINNERMAN
TNG	TUNGSOL
TOR	TOR MFG.
TR	TRUMBEL
TRAN	TRANSELECTRONICS
TRE	TRERICE
TRIM	TRIMM
TRID	TRID LABS. INC.
TX	TEKTRONIX
UI	UNISTRUT
ULAN	ULANET CO., GEO.
UN	UNIMAX
USDC	U.S. ELECT. DEVEL.
USEC	U.S. ENG. CO.
USG	U.S. GAUGE
UTAH	UTAH
UTC	UNITED TRANSFORMER
VAL	VALOR INSTRUMENTS INC.
VEC	VECTOR ELECTRONICS
VEECO	VEECO
VIK	VIKING
VYR	VEYOR CORP.
WA	WALSCO
WAFD	WAKEFIELD ENGR.
WAT	WATERS
WB	WARNER BRAKE
WE	WESTINGHOUSE
WEL	WELWYN
WES	WESTON
WH	WAHLGREN
WHD	WEATHERHEAD
WHIT	WHITLOCK
WIN	WINCHESTER
WK	WECKESSER
WL	WARD LEONARD
WP	WESTCAP
WRMD	WIRE MOULD
WRNE	WESTERN ELECTRIC
WSPT	WESTPORT
WYCO	WYCO METAL PROD.
YO	YOUNG RADIATOR

ENGINEERING PARTS LIST

DATE 1-14-65 PAGE 1 MANUAL
REV. B CONT'D ON 2 REQUISITION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M-DAY	DA
SML 100A	104	3808	40460				

REV.	ITEM	*R.S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER PART NUMBER	QTY. ASSY.	QTY. UNIT	CODE	KARDEX	PICK
				50004	Schematic			-	-			
				43679	Wiring			-	-			
				50002	Assembly (SML-100A)			-	-			
				43680	Wiring, Component Mtg.			-	-			
				43632	Silkscreen, Front Panel			-	-			
				32709	Silkscreen, Rear Chassis			-	-			
				43635	P.C. Card Assy			-	-			
				32710	P.C. Card Assy			-	-			

*R.S. - RECOMMENDED AS CUSTOMER SPARES

LING ELECTRONICS A division of LING-TEMCO

DEPARTMENT ISSUED BY ISSUE DATE

ENGINEERING PARTS LIST

DATE [illegible] PAGE 2 MANUAL
REV. — CONT'D ON 2 REQUISITION NO

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	FON	QTY.	ACCOUNT NO.	M.DAY
SML-100A						

SUB ASSY	ITEM	*R.S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER'S PART NUMBER	QTY. ASSY.	QTY. UNIT	CODE	[illegible]	[illegible]
				50002	Assembly			(1)	(1)			
	1			43631	Panel, Front			1	1			
	2			50003	Chassis			1	1			
	3			43630-1	Chassis, Support			1	1			
	4			43630-2	Chassis, Support			1	1			
	5			43634	Cover, Top			1	1			
	6			43633	Cover, Bottom			1	1			
	7			15202	Bracket, Top Cover			1	1			

*R.S. - RECOMMENDED AS CUSTOMER SPARES

DEPARTMENT ISSUED BY [illegible]

ENGINEERING PARTS LIST

DATE 1-20-71 PAGE 3 MANUAL
REV. A CONT'D ON 4 REQUISITION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M-DAY
SML 100A						

REV.	ITEM NO.	*R.S.	SYMBOL DESIG.	STOCK DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER PART NUMBER	QTY. ASSY.	QTY. UNIT	COST	KARDEX
A	8			82136-0001	Handle	GAXY	28-15	2	2		
	9			82136-0008	Ferrule	GAXY	205	4	4		
				82575-0014	Screw, Fastener - 3/16 Panel, Slotted	SOUTHCO	54-36-809-24	4	4		
A	10			82186-0041	Lamp Holder	ELDEMA	DHKB-14B	5	5		
A	11		DS1,2, 3,4,5	82185-0027	Lamp, Neon	ELDEMA	CG03-ATS-A1C	5	5		
A	12			82186-0042	Lamp Holder	ELDEMA	DMKB-6RTB	1	1		
A	13		DS6	82185-0026	Lamp, Neon with 33K Res.	ELDEMA	CG32R-NE2P-33K	1	1		
	14		S2-S6	82285-0048	Switch Pushbutton DPST	GRHL	35-1	5	5		
A	15		R1,R3, R5,R7, R9	82253-0505M	Potentiometer, 5M 2W		CU-5052	5	5		
A	16		R25	82252-0502K	Potentiometer, 5K 2W		CLU-5021	1	1		

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DEPARTMENT ISSUED BY ISSUE DATE

LINC ELECTRONICS

ENGINEERING PARTS LIST

DATE 1-20-64 PAGE 4 MANUAL
REV. A CONT'D ON 5 REQUISITION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M-DAY
SML 100A						

REV.	ITEM	*R.S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER PART NUMBER	QTY. ASSY.	QTY. UNIT	COST	PARTS
	17		R11	82257-0031	Potentiometer - Precesion 10 Turn 1K ± 5% Linearity ±½% 2W	BECK	7216	1	1		
	18		S1	82285-0023	Switch - Rotary 6 Section 6 Pole 2-11 Pos	CRL	PA 1022	1	1		
	47			80099-0087	Card Guide - 1/16 Board 7/16 Mtg. Ctr. 1 7/8" High	VECTOR	BR-7	5	5		
	19			80115-0021	Knob, Round Dial, Matte	RAY	70-3-2G	6	6		
	20		M1	82360-0021	Meter - 0-500 Micro-Amp DC (Meter face to be so marked)	AMM	AM-2	1	1		
A	21			82176-0028	Dial, 10 Turn Digital	BORG	Model 1309	1	1		
A	22		K601,701 K801,901	PS 10814	Relay - 3 PDT 10,000 ohm Coil 11 Pin Plug-In, Metal Case	MCI	RM3C-60LF	4	4		
	23			82280-0018	Socket - 11 Pin	AMP	77M1P11	4	4		
A	24		J11-J15	80101-0006	Connector, P.C. (Keyed B)	AMP	143-010-02-1002	5	5		
			C1-C5	83014-0105K	Capacitor, 1 mf 400V Mylar	WP	WF70K4105	5	6		
			R2,4,6, 8,10	82230-0513J	Resistor, 51K ½W 5%	O		5	5		
A			R35	82230-0104J	Resistor, 100K ½W 5%	O		1	1		

*R.S. - RECOMMENDED AS CUSTOMER SPARES

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DEPARTMENT ISSUED BY DATE

ENGINEERING PARTS LIST

DATE ____ PAGE ____ MANUAL ____

REV. A CONT'D ON ____ REQUISITION NO. ____

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M DAT	AT
SML 100 A							

F.N.	ITEM NO.	*R.S.	SYMBOL DESIG.	STD. K'DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER PART NUMBER	QTY. ASSY.	QTY. UNIT	CODE	KARDEX	
	25		J1-J5	80100-0051	Connector, Male	CAN	XLR-3-14	5	5			
	26		J6-J7	80100-0113	Connector, Female	CAN	XLR-3-13	2	2			
	27		J8	82410-0011	Connector, A.C. Power	HU	7486	1	1			
				21783-24	Power Cord, 2 Ft. Lg.			1	1			
A	28			82180-0040	Capacitor Insulating Sleeve	SP	HK-7-6	4	4			
	29											
	30		XF1	80143-0012	Fuse Holder	LI	342004	1	1			
	31	/	F1	82145-0015	Fuse, Slo Blo 3AG 2Amp	LI		1	1			
	32		T1	82310-0010	Transformer 115V Primary 280V w/ct at 90 MA & 6.3V at 5A	MERIT	P-3052	1	1			
	33	/	C6,C7, C8,C9	82043-0800	Capacitor 80 μf 450V Elect.	SP	TVL-1735	4	4			
	34		XV1	82280-0008	Socket, 9 Pin Shield Type	ELCO	TS103P01	1	1			
	35		V1	82130-0039	Tube, 9 Pin Hi-Mu Triode	RCA	12AT7	1	1			

*R.S. - RECOMMENDED AS CUSTOMER SPARES

DEPARTMENT ____ ISSUED BY ____ ISSUE DATE ____

ENGINEERING PARTS LIST

DATE 3-4-[illegible] PAGE 5 MANUAL
REV. A OPTION 2 REDISTRIBUTION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PCN	QTY.	ACCOUNT NO.	MADE
SML 100A						

SEC.	ITEM	R. S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER'S PART NUMBER	QTY. ASSY.	QTY. INT.	CODE	REMARKS
	36		XV2,3 4	82280-0007	Socket, 7 Pin Shield Type	ELCO	TS102P01	3	3		
	37		V2	82130-0028	Tube, 7 Pin Med Mu Triode	RCA	6C4	1	1		
	38		V3	82130-0001	Tube, Volt Reg. 151V	RCA	0A2	1	2		
			V4		Tube, Volt Reg. 151V	RCA	0A2	1	-		
			R12	82230-0392J	Resistor, 3.9K 5% ½W			1	2		
			R13	82230-0220J	Resistor, 22 ohm 5% ½W			1	2		
			R14	82237-0152J	Resistor, 1.5K 10W W.W			1	1		
			R15		Resistor, 22 ohm 5% ½W			1	-		
			R16	82237-0252J	Resistor, 2.5K 10W W.W.			1	1		
			R17	82237-0402J	Resistor, 4K 10W W.W.			1	1		
A			R18	82230-0514J	Resistor, 510K 5% ½W			1	1		
			R19	82230-0333J	Resistor, 33K 5% ½W			1	2		

*R.S. - RECOMMENDED AS CUSTOMER SPARES

DEPARTMENT ISSUED BY ISSUE DATE

ENGINEERING PARTS LIST

DATE 6/12/81 PAGE 2 PANEL
REV. CONT'D ON REVISION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	W DAY
SML 100A						

			SYMBOL DESIG.	STOCK/DWG. NUMBER	DESCRIPTION	MFG CODE	MANUFACT'R PART NUM.	QTY. ASS'Y	QTY. IN
			R20	82230-0432J	Resistor, 4.3K 5% ½W			1	1
			R21	82236-0103J	Resistor, 10K 5W W.W.			1	1
			R22	82230-0103J	Resistor, 10K ½W 5%			1	1
			R23	82230-0105J	Resistor, 1M ½W 5%			1	1
			R24	82230-0332J	Resistor, 3.3K ½W 5%			1	1
			R26	82230-0102J	Resistor, 1K ½W 5%			1	1
			R27		Resistor, 3.3K ½W 5%			1	=
			R28	82230-0752J	Resistor, 7.5K ½W 5%			1	1
			R29	82230-0224J	Resistor, 220K ½W 5%			1	2
			R30	82230-0205J	Resistor 2M ½W 5%			1	1
			R31	82230-0472J	Resistor, 4.7K ½W 5%			1	-
			R32		Resistor, 220K ½W 5%			1	-

*R.S. - RECOMMENDED AS CUSTOMER SPARES

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ENGINEERING PARTS LIST

DATE 5/12/65 PAGE 8 MANUAL
REV. — CONT'D ON 9 REQUISITION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M-DAY	DAT
SML 100A							

REV.	ITEM	*R.S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER PART NUMBER	QTY. ASSY.	QTY. UNIT	CODE	KARDEX	PURCH. ORDER
			R33	82230-0334J	Resistor, 330K ½W 5%			1	2			
			R34		Resistor, 330K ½W 5%			1	-			
		!	CR1-CR9	82110-0026	Diode, 750 MA 600PIV	IRC	IN2071	9	9			
			C10	82028-0101	Capacitor, 100μfd 3U Elec.	AR	PTT 13	1	1			
			C11	83014-0105K	Capacitor 1.0 μF 400V Met. Mylar	WP	WF70K4105	1	-			
			C12	83014-0104K	Capacitor, .1μF 400V Met. Mylar	WP	WF70K4104	1	2			
			C13		Capacitor .1μF 400V Met. Mylar	WP	WF70K4104	1	-			
			C14	82060-0103	Capacitor .01 μf 600V Disc. Ceramic			1	1			
			C15	82026-0251J	Capacitor 250 μμf 500V Silver Mica			1	1			
	39			82270-0002	Shield, 1 3/4" H 7 Pin		TS102U02	1	1			
	40			82270-0003	Shield, 2¼" H 7 Pin		TS102U03	2	2			
	41			82270-0005	Shield, 1 15/16 H 9 Pin		TS103U02	1	1			

*R.S. - RECOMMENDED AS CUSTOMER SPARES

DEPARTMENT ISSUED BY ISSUE DATE

LING ELECTRONICS

ENGINEERING PARTS LIST

DATE 3-20-64 PAGE 2 PLAN AI
REV. A CONT'D ON 10 REQUISITION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	FCN	QTY.	ACCOUNT NO.	X-RAY
SML 100A						

ITEM	INDEX	*R.S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER'S PART NUMBER	QTY. ASSY.	QTY. UNIT			
	42			21254	Nameplate			1	1			
	43		TB1	80112-0003	Terminal Board	CJ	3-142-Y	1	1			
	44		TS4,TS5	80112-0103	Terminal Strip, 2 Lug with 1 Mtg Foot	CJ	52	1	1			
A	45		TS1,2,3 6,7,8	80112-0126	Terminal Strip, 4 Lug 5/16 Spacing Mtg 1 5/8 Ctrls	CJ	2004	6	6			
	46		TS9	80112-0008	Terminal Strip 4 Lug	CJ	54-B	1	1			
				82339-0007	Wire, Coaxial RG-174/U		(Free Stock)	A/R	A/R			
				82326-2200	Wire, #22 Blk		(Free Stock)	A/R	A/R			
				82326-2000	Wire, #20 Blk		(Free Stock)	A/R	A/R			
				82326-1800	Wire, #18 Blk		(Free Stock)	A/R	A/R			
				82333-1600	Wire, #16 Blk		(Free Stock)	A/R	A/R			
				82326-2290	Wire, #22 Wht/Blk		(Free Stock)	A/R	A/R			
				82326-2201	Wire, #22 Brn		(Free Stock)	A/R	A/R			

*R.S. - RECOMMENDED AS CUSTOMER SPARES

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ENGINEERING PARTS LIST

DATE 5-23-[illegible] PAGE 11 MANUAL
REV. - ENTRY 11 REQUISITION NO:

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M-DAY
SML-100 A						

ITEM	R	SYMBOL DESIG.	STOCK/DWG. NUMBER	DESCRIPTION	MFG.	MANUFACTURER PART NUMBER	UNIT	UNIT	CODE	REMARKS
			82326-2001	Wire #20 Brn		Free Stock	A/R	A/R		
			82326-2002	Wire #20 Red		Free Stock	A/R	A/R		
			82326-2092	Wire #20 Wht/Red		Free Stock	A/R	A/R		
			82326-2204	Wire #22 Yellow		Free Stock	A/R	A/R		
			82326-2205	Wire #22 Green		Free Stock	A/R	A/R		
			82326-2206	Wire #22 Blue		Free Stock	A/R	A/R		
			82326-2007	Wire #20 Purple		Free Stock	A/R	A/R		
			82326-2097	Wire #20 Wht/Purple		Free Stock	A/R	A/R		
			82326-2208	Wire #22 GREY		Free Stock	A/R	A/R		
			82326-2298	Wire #22 Wht/Grey		Free Stock	A/R	A/R		
			82326-2098	Wire #20 Wht/Grey		Free Stock	A/R	A/R		
			82326-2209	Wire #22 Wht		Free Stock	A/R	A/R		

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ENGINEERING PARTS LIST

DATE 6-5-67 PAGE 11 MANUAL
ECN — ATTACHED TO REQUISITION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PCN		ACCOUNT NO.	M-DAY	DAT
SML-100A							

	LN M	R S	SYMBOL DESIG	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MFG PART NUMBER	QTY ASSY	QTY UNIT		KEY	PURCH
	48			43635	**P.C. Card Assembly Consisting of the following:**			(1)	(1)			
				43636	P.C. Card Assembly			1	1			
			C601,701 801,901	83014-0105K	Capacitor, Met. Mylar 1 µf 400V	WP	WF70K4105	4	8			
			C602,702 802,902		Capacitor, Met. Mylar 1 µf 400V	WP	WF70K4105	4	-			
			C603,703 803,903	82022-0015K	Capacitor, Mylar Paper .1 µf 400V		DPM54P1	4	12			
			C604,704 804,904		Capacitor, Mylar Paper .1 µf 400V			4	-			
			C605,705 805,905		Capacitor, Mylar Paper .1 µf 400V			4	-			
			C606,706 806,906	82060-0103	Capacitor, Ceramic Disc .01 µf 500/600V			4	4			
			R601,701 801,901	82230-0154	Resistor 150K 1/2W 5%			4	20			
			R602,702 802,902		Resistor 150K 1/2W 5%			4	-			
			R603,703 803,903		Resistor 150K 1/2W 5%			4	-			
			R604,704 804,904		Resistor 150K 1/2W 5%			4	-			

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ENGINEERING PARTS LIST

DATE 1-14-65 PAGE 16 MANUAL
REV. E CONT'D ON 17 REQUISITION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M-DAY	E-
SML-100A							

REV.	IND.	*R.S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFR CODE	MANUFACTURER PART NUMBER	QTY. ASSY.	QTY. UNIT	G.D.	KARDEX	E.O.
			R607,707 807,907	82230-0105J	Resistor, 1M ½W 5%			4	12			
			R608,708 808,908		Resistor, 1M ½W 5%			4	-			
			R609,709 809,909	82230-0225J	Resistor, 2.2M ½W 5%			4	8			
			R610,710 810,910		Resistor, 2.2M ½W 5%			4	-			
			R611,711 811,911		Resistor, 150K ½W 5%			4	-			
A			R612,712 812,912	82230-0102J	Resistor, 1K ½W 5%			4	4			
			R613,713 813,913		Resistor, 1M ½W 5%			4	-			
			R614,714 814,914	82230-0394J	Resistor, 390K ½W 5%			4	4			
			R615,715 815,915	82257-0030	Potentiometer 2K W.W. Minuature	IRC		4	4			
M			R616,716 816,916	82230-0560J	Resistor, 56 ohm ½W 5%			4	4			

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DEPARTMENT ISSUED BY DATE

ENGINEERING PARTS LIST

DATE 2-14-65 PAGE 13 MANUAL
REV. B CONT'D ON 4 REQUISITION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M-DAY	DATE
SML-100A							

REF.	ITEM NO.	*R.S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER PART NUMBER	QTY. ASSY.	QTY. UNIT	CODE	KARDEX	PURCH. OUT
		2	CR601,701 801,901	82110-0022	Diode, Silicon	TI	TI56	4	16			
			CR602,702 802,902		Diode, Silicon	TI	TI56	4	-			
			CR603,703 803,903		Diode, Silicon	TI	TI56	4	-			
			CR604,704 804,904		Diode, Silicon	TI	TI56	4	-			
		1	V601,701 801,901	82130-0067	Tube, Hi Mu Twin Triode	RCA	6201	4	4			
			XV601,701 801,901	82280-0049	Socket, 9 Pin P.C. Type with Shield Base	CJ	9PC-M2	4	4			
				82270-0005	Shield, 9 Pin Long	ELCO	TS103U02	4	4			
				82170-0004	Heat Insert	BIR	75014-2	15	15			
				82170-0002	Heat Insert	BIR	75013-3	2	2			
				82170-0006	Heat Insert	BIR	75013-2	1	1			

S. - RECOMMENDED AS CUSTOMER SPARES

DEPARTMENT ISSUED BY ISSUE DATE

ENGINEERING PARTS LIST

DATE _____ PAGE 13 MANUAL _____

REV. A CONT'D ON 14 REQUISITION NO. _____

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M-DAY	DATE
SML 100A							

REV.	ITEM	R.S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER PART NUMBER	QTY. ASSY.	QTY. UNIT	O.E.	KARDEX	P.O. ORD.
	49	1		32710	Card Assy Consisting of			(5)	(5)			
				32711	P.C. Card			1	5			
			C1	83003-0271S	Capacitor, 270 μμf 500V Dipped Silver Mica	ARCO	DM15-271J	1	5			
			C2	82060-0103	Capacitor, .01 μf 600V Ceramic Disc			1	5			
			C3	83003-0050S	Capacitor, 5 μμf 500V Dipped Silver Mica	ARCO	DM 15-050J	1	5			
			C4	83003-0511S	Capacitor, 510 μμf 500V Dipped Silver Mica	ARCO	DM15-511J	1	5			
			C5	83003-0011S	Capacitor, 10 μμf 500V Dipped Silver Mica	ARCO	DM15-100J	1	5			
			D1,D2	82185-0009	Lamp - Neon	GE	NE-2	2	10			
			R1	82230-0513J	Resistor, 51K ½W 5%			1	5			
			R2	82230-0105J	Resistor, 1M ½W 5%			1	10			

R.S. - RECOMMENDED AS CUSTOMER SPARES

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DEPARTMENT ISSUED BY ISSUE DATE

ENGINEERING PARTS LIST

DATE 5-1-67 PAGE 15 MANUAL
REV. — CONT'D ON 16 REQUISITION NO.

MODEL OR ASSY. SML 100 A | SERIAL NO. | SHOP ORDER | FOR | QTY. | ACCOUNT NO. | MODEL

A	N	R	SYMBOL DESIG.	STOCK OR DWG. NUMBER	DESCRIPTION	MFR CODE	MANUFACTURER PART NUMBER	QTY. PER	QTY. UNIT	D	REMARKS
			R3	82230-0203J	Resistor, 20K ½W 5%			1	5		
			R4	82230-0224J	Resistor 220K ½W 5%			1	10		
			R5	82230-0514J	Resistor, 510K ½W 5%			1	5		
			R6	82230-0104J	Resistor, 100K ½W 5%			1	5		
			R7	82230-0225J	Resistor, 2.2M ½W 5%			1	5		
			R8	82230-0124J	Resistor, 120K ½W 5%			1	5		
			R9		Resistor, 1M ½W 5%			1	-		
			R10	82230-0103J	Resistor, 10K ½W 5%			1	5		
			R11		Resistor, 220K ½W 5%			1	-		
			R12	82230-0563J	Resistor, 56K ½W 5%			1	5		
			R13	82230-0623J	Resistor, 62K ½W 5%			1	5		
			R14	82230-0475J	Resistor, 4.7M ½W 5%			1	5		

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DEPARTMENT | ISSUED BY | ISSUE DATE

ENGINEERING PARTS LIST

DATE 5/1/58 PAGE 16 MANUAL
REV. CONT'D ON REQUISITION NO.

MODEL OR ASSY.	SERIAL NO.	SHOP ORDER	PON	QTY.	ACCOUNT NO.	M-DAY	DATE
SML 100A							

REV.	ITN EM.	*R. S.	SYMBOL DESIG.	STOCK/DWG NUMBER	DESCRIPTION	MFG CODE	MANUFACTURER PART NUMBER	QTY. ASSY.	QTY. UNIT	CODE	KARDEX	PURCHASE ORDER
			R15	82230-0561J	Resistor, 560 ohm ½W 5%			1	5			
			V1	82130-0043	Tube, High Mu Triode	RCA	12AX7	1	10			
			V2		Tube, High Mu Triode		12AX7	1	-			
			XV1,2	82280-0001	Socket, P.C. 90° 9 Pin	AR	RA-9A	2	10			

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MA34252